

Food Handler's Infection (Swine Erysipelas) in Man

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SUMMARY

Swine erysipelas in man can at times be a serious and even fatal disease.

The usual cutaneous type runs a prolonged course when treated by any of the older methods.

Experimental and clinical evidence indicates that penicillin aids greatly in the treatment of the disease.

ERYSIPELOID of Rosenback (swine erysipelas) in man, long a common disease in Europe, is now being encountered more frequently in this country.¹¹ Cases of it are seen fairly often by industrial physicians who care for employees of large food processing plants and occasionally by physicians in private practice among patients working in a variety of industries.

As the disease may be serious or even fatal, although usually a fairly benign self-limited skin lesion, recognition and understanding of the infection is important.

Most of the literature on the subject is in periodicals which the industrial physician is not likely to encounter casually, such as journals of bacteriology, animal husbandry and dermatology.

The disease occurs most frequently in meat processors and in handlers of fish,⁵ especially shellfish. Often the organism enters through a puncture wound such as may be caused by the bite of a lobster or the prick of a bone spicule, or through an existing skin abrasion.

There have been large series of cases reported in other occupational groups, such as fertilizer manufacturers and button workers.⁸ In this latter group, many of those who had had contacts with the bone dust had severe bronchitis, the organism having entered through the bronchial mucous membrane. In these cases presence of the organism was not proved bacteriologically.

Although the organism is found on much of the food eaten by humans, only one case is reported in which entry was by way of the gastro-intestinal tract.² The patient supposedly got the disease from eating salt pork. Direct transmission from pigs to man is uncommon. Although there is no disease of fish known to be caused by *Erysipelothrix rhusiopathia*, the slime on the body of the fish seems to attract large numbers of the organisms.

It is now accepted that the erysipeloid of Rosenback and swine erysipelas in man are one and the

same, and that the disease is caused by *Erysipelothrix rhusiopathia*.¹⁰ This organism is a non-motile Gram-positive, microaerophilic rod which is found widespread on decomposing nitrogenous matter. It is usually saprophytic, but may easily become pathogenic. There are three strains of *Erysipelothrix rhusiopathia*: human, swine and mouse. The mouse strain is important mainly because it affords material for experimental evaluation of therapeutic agents.

In the infection in swine, there are three distinct clinical types of the disease which are quite common to man, and it is from these that most of the present knowledge has been gained. Cases of each of the three types have been reported in man. They are:

1. Acute fulminating septicemia, which in the past has been fatal to pigs in 80 per cent of cases. Two proven cases of septicemia in man, both fatal, have been carefully studied and completely reported.^{6,9} It is interesting that in the case reported by Klauder, the original skin lesion was at the site of incision for drainage. There is a distinct possibility that the organism thus entered the blood stream.

2. The subacute cardiac or polyarthritic type. This probably is an aftermath in patients who have survived the acute blood stream infection. The clinical course and findings are much like those of rheumatic fever in man, with valvular vegetations and joint changes.

3. The cutaneous type of "diamond skin disease" is the mildest and most common in both swine and man.

THE INFECTION IN MAN

The skin lesion in man is very similar in appearance to that of erysipelas, with an advancing, violet, slightly elevated border and lighter center.

It is distinguished by the fact that the center fades without desquamation. There are localized itching and burning but only occasional general symptoms and never suppuration except from secondary infection. The lesion is rarely seen above the wrists. There may be arthritic manifestations in the joints in the involved hand. If the patient is a food handler—90 per cent of them are—that helps to confirm the diagnosis. On blood smear the monocytes are usually found to be increased. Diagnosis can be made by culturing the organism from biopsy specimen from the skin, but in view of the serious consequences of bloodstream infection, this should not be undertaken lightly.

The cutaneous form of the disease is usually self-limited, lasting ten to 20 days, but it may recur over a period of months.

It is because the condition is to a large extent self-limited that evaluation of methods of treatment has been confusing. Statistics based on small series

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are of no value. Larger series reported upon before the use of penicillin⁴ show an average duration of seven to 17 days, regardless of the type of treatment. Local measures such as x-ray, carbon dioxide snow, and ointments, as well as antisera and the sulfonamides, have been tried with no significant difference in results.

When the sulfonamides were introduced they were expected to solve the problem. Working experimentally with mice, Klauder⁷ concluded that they had only a "limited therapeutic effect." Mortality was 100 per cent in an untreated control group. The mortality rate was 85 per cent in a second group given a course of sulfonamide beginning immediately after inoculation of the organism. In a third group given sulfonamide therapy, both before and after inoculation, the mortality rate was 50 per cent. The results of Heilman and Herrell⁸ are spectacular in contrast. Forty infected mice were treated with penicillin and only two (5 per cent) died, whereas all 40 of the untreated mice died. These investigators had previously demonstrated the sensitivity of the organism to penicillin, *in vitro*.

Penicillin is especially effective in the treatment of the more serious (but rare) septicemia with generalized manifestations. In one case reported by Ehrlich¹ the patient had generalized bullae and high fever, probably on an anaphylactic basis. There was rapid response to massive, frequent doses of penicillin, with eventual complete recovery.

Results in three cases reported in succeeding paragraphs indicate that penicillin may help in shortening the course of even the mild cutaneous type. As the patients were treated during a period when penicillin was just coming into general use, the reports indicate the better results obtained with increasing the dosage of the drug as it became more readily available.

CASE REPORTS

CASE 1.—The patient received a puncture wound on the left thumb while cleaning fish in January 1945. A rash appeared at the site and he sought medical advice four days later. Local compresses were used over a two-week period with gradual subsidence of symptoms. A week or so later, however, there was recurrence of the skin rash on the thumb and extending to the dorsum of the hand. Compresses were started immediately and on the third day 50,000 units of penicillin in normal saline were given intramuscularly. This was repeated 48 hours later. The rash faded and the patient was discharged two days later. There has been no recurrence. The whole course of the disease lasted a month.

CASE 2.—The patient was scratched on the dorsum of the right hand by a crab shell in October 1945. He was first seen at the office two days later. A glycerin and alcohol compress was applied to the hand and 100,000 units of penicillin were given daily for four days. The patient was discharged on the fifth day and there has been no recurrence.

CASE 3.—The patient was first seen in the office October 20, 1947. Two days before he had received a puncture wound on the flexor surface of the right little finger from a fish bone. There was tenderness on motion of the finger,

causing suspicion of tendon sheath involvement. The patient was sent immediately to the hospital where 100,000 units of penicillin was given as an initial dose, and then 30,000 units every three hours for 36 hours. He insisted on leaving the hospital at the end of 44 hours. There has been no recurrence. At no time did the patient have fever or other general symptoms. At the time of hospitalization, leukocytes numbered 7,800 with a normal differential save for a slightly increased monocyte count.

COMMENT

In none of these cases was any attempt made to culture the organism, but the skin lesion in each was quite characteristic and there could be no doubt as to the clinical diagnosis. All were fish handlers. It should be added that all food handlers who come under the author's care for puncture wounds or abrasions receive a prophylactic injection of tetanus antitoxin. The patient in Case 1 could well have had spontaneous recovery coincidental with the administration of the penicillin. It is difficult to believe that two small doses of penicillin 48 hours apart could have altered the course of the disease to any marked degree.

However, as the patient in Case 2 was seen earlier in the course of the disease and treated more intensively, it is reasonable to believe that penicillin may have played a part in the rapid recovery. By present standards the dosage given was woefully inadequate.

The third patient had large and frequent doses and recovery was rapid and complete.

Discussion by J. MINTON MEHERIN, M.D., San Francisco

Swine erysipelas in man, although not uncommonly encountered, is commonly not recognized. With the universal use of penicillin for most types of infection the lack of recognition may not be of such great importance unless the possible seriousness of the infection is entirely overlooked and it is treated by local and ineffective measures. An understanding of the lesion may be of value in prevention of it. Workers exposed to the organism should be instructed to scrub their hands with soap and water whenever they suffer an abrasion, laceration or a puncture wound. The time consumed may be repaid many times.

All of the cases that I have seen have been in handlers of raw shellfish. In most cases the infection started in minor breaks in the skin about the fingernails. Before the advent of penicillin, I was convinced that the progress of the lesion was definitely impeded by the use of the sulfonamides. A colleague treating a similar group of patients thought that the drug had no effect on the condition. A recent case which had been neglected for five days cleared up satisfactorily in 48 hours with two injections of 300,000 units of penicillin in wax. I have never seen a case of septicemia from this organism.

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